

What is claimed is:

1. A crystal oscillator, comprising:  
an oscillation unit comprising a crystal vibrator  
5 having a frequency-temperature characteristic with  
which a resonance frequency changes according to a  
temperature, and an oscillation circuit unit; and  
a heat source unit, which abuts against the  
crystal vibrator, keeping a temperature of the crystal  
10 vibrator higher than a temperature where the crystal  
vibrator causes abnormal oscillation.
2. The crystal oscillator according to claim  
1, wherein  
15 the crystal vibrator is kept at a temperature  
higher than 0 °C.
3. The crystal oscillator according to claim  
1, wherein  
20 said heat source unit is configured by a power  
transistor which amplifies an oscillation output.
4. The crystal oscillator according to claim  
1, wherein  
25 said heat source unit is configured by a power

transistor which configures a power supply.

5. The crystal oscillator according to claim 1, wherein

5 the abnormal oscillation is caused by a micro-jump which occurs in the crystal vibrator.

6. A crystal oscillator, comprising:  
an oscillation unit having a crystal vibrator; and  
10 a heat source unit keeping a temperature of the crystal vibrator higher than a temperature where the crystal vibrator causes abnormal oscillation.

7. The crystal oscillator according to claim 15 6, wherein

said heat source unit keeps the crystal vibrator at a temperature higher than 0 °C.

8. The crystal oscillator according to claim 20 6, wherein

said heat source unit is configured by a power transistor.

9. The crystal oscillator according to claim 25 8, wherein

said heat source unit is configured by a power transistor which amplifies an oscillation output.

10. The crystal oscillator according to claim  
5 8, wherein

said heat source unit is configured by a power transistor which configures a power supply.

11. The crystal oscillator according to claim  
10 6, wherein

the abnormal oscillation is caused by a micro-jump which occurs in the crystal vibrator.

12. The crystal oscillator according to claim  
15 6, further comprising

a control unit controlling heat generated by said heat source unit based on a temperature of the crystal vibrator.

20 13. A crystal oscillator, comprising:  
oscillation means having a crystal vibrator; and  
heat source means for keeping a temperature of the crystal vibrator higher than a temperature where the crystal vibrator causes abnormal oscillation.

14. A signal oscillation method preventing abnormal oscillation of an oscillator having a crystal vibrator, comprising:

5 keeping a temperature of the crystal vibrator higher than a temperature where the crystal vibrator causes abnormal oscillation; and

outputting a signal in a state where the temperature is kept.